Idaho National Engineering & Environmental Laboratory
Bechtel BWXT Idaho LLC.

WELL HEAD HOUSES

Summary:
The well head houses are corrugated steel structures that have been built around several TAN well heads. They sit on concrete foundations that incorporate all the utilities and well connections. The houses are 8 feet square by 10 feet tall and are built so that they can be lifted off a foundation with a crane. The houses have been designed to allow utilities (e.g., electricity) to be quickly disconnected so that the houses can simply be moved out of the way when the well heads have to be serviced and quickly reinstalled when the service is complete. In the past, structures around TAN well heads had to be demolished and rebuilt when a well head needed to be serviced. These new well houses avoid those expenses.

The implementation of the well houses reduces cost and time required for well-head service. The cost and the associated time required to demolish and rebuild the old houses are avoided.

No previously identified needs exist in the STCG system

The need addressed was to provide a simpler way to disconnect the well head enclosure when one of these wells required servicing. The previous design necessitated the destruction of the enclosure and reconstruction of a new enclosure.

Qualitative Benefit Analysis		
Programmatic Risk	●	Streamlining the process will save time and money over the lifetime of the TAN well monitoring project.
Technical Adequacy	●	The new design is much more utilitarian than the original design. Not only can the well house be removed much more easily than the original structure, it also provides a much more stable working environment when installed. Due to the huge fluctuation in Idaho weather and the project need to sample a well head in a stable environment, the stable work environment is key.
Safety	●	Eliminating the demolition process avoids the increased risk of bodily injury to workers. The new houses are also more resistant to intrusion by rodents.
Schedule Impact	◒	There is less time involved in disconnecting and moving one of these structures than in tearing down and rebuilding, as was done in the past.

Quantitative Benefit Analysis	
Cost Impact Analysis	Cost avoidance was achieved by not having to demolish and rebuild the enclosures around well heads every time major servicing was needed and by not having to remove the roof every time minor servicing was needed. The average cost to construct one of the old well houses was $11,000. The average cost of material and labor to construct one of the new houses is $15,000. This amounts to an extra $4,000 per new house. Both the old and new house designs require minor servicing twice per year over the assumed 30-year life of the well. This would be 60 servicing events for each. The costs vary however. The old houses require $3,000 in servicing while the new houses are slightly less at $2,250. The life-cycle savings here would be $45,000. The old houses require major service at $11,000 at least once in their 30-yr. Life, while the new design requires no major servicing. This is another $11,000 saved. This $56,000 saved on over a 30-year span of monitoring and servicing of is reduced by the $4,000 in extra construction costs to $52,000 per year. There are three wells at TAN that utilize these well houses; therefore, the total savings would amount to $156,000. Divided by 30 years, this amounts to $5,200 saved per year at TAN.
	Annual Savings per well $1,866
	Life Cycle Cost Savings per well $52,000
	Life Cycle Cost Savings at TAN $156,000
	Return-On-Investment (ROI) 43 %

Worksheet 1: Operating & Maintenance Annual Recurring Costs

Expense Cost Items *	Before (B) Annual Costs	After (A) Annual Costs
1. Equipment	$ -	$ -
2. Purchased Raw Materials and Supplies	$ -	$ -
3. Process Operation Costs:		
Utility Costs	$ -	$ -
Labor Costs	$ -	$ -
Routine Maintenance Costs for Processes	$ 6,366.67	$ 4,500.00
Subtotal	$ 6,366.67	$ 4,500.00
4. PPE and Related Health/Safety/Supply Costs	$ -	$ -
5. Waste Management Costs:		
Waste Container Costs	$ -	$ -
Treatment/Storage/Disposal Costs	$ -	$ -
Inspection/Compliance Costs	$ -	$ -
Subtotal	$ -	$ -
6. Recycling Costs		
Material Collection/Separation/Preparation Costs:		
a) Material and Supply Costs	$ -	$ -
b) Operations and Maintenance Labor Costs	$ -	$ -
Vendor Costs for Recycling	$ -	$ -
Subtotal	$ -	$ -
7. Administrative/other Costs	$ -	$ -
Total Annual Cost:	$ 6,366.67	$ 4,500.00

* See attached Supporting Data and Calculations.

Worksheet 2: Itemized Project Funding Requirements*
(i.e., One Time Implementation Costs)

Category	Cost $
INITIAL CAPITAL INVESTMENT	
1. Design	$ -
2. Purchase	$ 4,000
3. Installation	$ -
4. Other Capital Investment (explain)	$ -
Subtotal: Capital Investment= (C)	$ 4,000
INSTALLATION OPERATING EXPENSES	
1. Planning/Procedure Development	$ -
2. Training	$ -
3. Miscellaneous Supplies	$ -
4. Startup/testing	$ -
5. Readiness Reviews/Management Assessment/Administrative Costs	$ -
6. Other Installation Operating Expenses (explain)	$ -
Subtotal: Installation Operating Expense = (E)	$ -
7. All company adders (G & A/PHMC Fee, MPR, GFS, Overhead, taxes, etc.)(if not contained in above items)	$ -
Total Project Funding Requirements=(C + E)	$ 4,000
Useful Project Life = (L) 30 Years Time to Implem 0 Months	
Estimated Project Termination/Disassembly Cost (if applicable) = (D)	$ -
(Only for Projects where L<5 years; D=0 if L>5 years)	

TOTAL LIFE-CYCLE COST SAVINGS CALCULATION FOR IPABS-IS

(Before - After) x (Useful Life) - (Total Project Funding Requirements + Termination)

Total Life Cycle Cost Savings Estimate = (B - A) x L - (C+E+D) $ 52,000

RETURN ON INVESTMENT CALCULATION

Return on Investment (ROI) % =

$$\frac{\textit{(Before - After) - [(Total Project Funding Requirements + Termination)/Useful Life]}}{\textit{[Total Project Funding Requirements + Project Termination]}} \times 100$$

$$ROI = \frac{(B-A)-[(C+E+D)/L}{(C+E+D)} \times 100 \quad 43 \ \%$$

O&M Annual Recurring Costs:				Project Funding Requirements:			
Annual Costs, Before=	$	6,367	(B)	Capital Investment=	$	4,000	(C)
Annual Costs, After=	$	4,500	(A)	Installation Op. Exp=	$	-	(E)
Net Annual Savings=	$	1,867	(B-A)	Total Project Funds=	$	4,000	(C+E)

Note: Before (B) and After (A) are Operating & Maintenance Annual Recurring Costs from Worksheet 1.

* See attached Supporting Data and Calculations.

Basis for Estimates

2 Purchase
The $4,000 figure is the difference between the old house cost of $11,000 and the new house cost of $15,000.

3	Process Operation Costs:

Utility Costs

Labor Costs

Routine Maintenance Costs for Processes

The only annual costs associated with the well houses are maintenance costs. The before costs are arrived at by adding one thirtieth of $11,000 for the major service to $3,000 times twice per year for minor service. This is $366.67 plus $6,000 or $6366.67. After costs are the $2,250 charge times two times per year for minor servicing. This is $4,500.

Summary

Net annual savings are $1,866.67. Over the 30-year life of the wells this adds up to $56,000. $4,000 dollars is deducted from this to account for the extra cost of the new house. This leaves $52,000 saved per well over its life. There are 3 TAN wells using this design so $156,000 in savings is possible.

SCIENCE AND TECHNOLOGY BENEFIT ANALYSIS
DEPLOYMENT APPROVALS

Technology Deployed: WELL HEAD HOUSES

Date Deployed: 12/14/00

EM Program(s) Impacted: Environmental Restoration Program

Approval Signatures

Lee Kehrle 8/21/01

Contractor Program Manager Date

N/A

Contractor Program Manager Date

Kathleen E Hain 8/23/01

DOE-ID Program Manager Date

N/A

DOE-ID Program Manager Date